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Attorney's Docket No.: 10006298-1
Amendment dated Feb. 8, 2008
Reply to Examiner's Answer dated Dec. 11, 2007

Remarks

I.   Status of claims

Claims 2-10, 12-18, and 20-30 were pending.

The Examiner has indicated that claims 9, 10, 17, 18, 23, and 24 would be allowable if amended to correct certain informalities, which have been addressed in this Amendment.

Claims 1, 11, 19, and 27-30 have been canceled without prejudice.

II.   Claim rejections under 35 U.S.C. § 103

A.   Claims 2, 12, 25, and 28-30

Claims 2, 12, 25, and 28-30 have been rejected under 35 U.S.C. § 103(a) over Manduca (U.S. 6,329,819) in view of Dhawan (U.S. 5,271,064).

1.   Independent claim 2

Independent claim 2 has been amended and now recites:

> 2.   A computer-implemented method, comprising:
>
> deriving blocks of image values from an image;
>
> for each of one or more of the blocks,
>
>> determining a respective histogram of image value differences in the block,
>>
>> computing a respective entropy value from the respective histogram, and
>>
>> based on the respective entropy value producing a respective result identifying the block as either an edge-containing block or a non-edge-containing block; and
>
> performing at least one operation on the image based on the respective results produced for ones of the blocks.

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The rejection of independent claim 2 under 35 U.S.C. § 103(a) over Manduca in view of Dhawan should be withdrawn because the cited references, taken either or alone or in any permissible combination, do not disclose or suggest each and every element of the claim.

Manduca discloses an autocorrection method of motion-correcting an MRI image (see abstract). In accordance with Manduca's disclosure, "The autocorrection method iteratively adjusts an estimate of the motion history (the relative motion at the time each view was acquired), starting from an initial estimate of zero motion, and trying corrections for different possible motion histories and searching for the highest quality resulting image" (col. 4, lines 42-44). At the end of each of the iterations, the quality of the image that is reconstructed from the motion-corrected views is determined by an image quality metric corresponding to the entropy of the gradient of the image (see col. 5, lines 43-65, and col. 7, lines 53-57). If the image quality metric is within a specified tolerance, the process is repeated for another set of views; otherwise the motion estimate is adjusted for the current set of view and the process is repeated (see col. 7, lines 58-64, and FIG. 2).

Manduca does not disclose any of the deriving, determining, computing, producing, and performing elements now recited in independent claim 2. For example, as acknowledged by the Examiner Manduca's image quality metric (i.e., the entropy of the gradient of an image) does not constitute the entropy of a respective histogram of image value differences in a block of image values. In addition, Manduca does not even hint that his entropy-based image quality metric could be used to produce "a respective result identifying the block as either an edge-containing block or a non-edge-containing block," as recited in claim 2. Furthermore, the block of views processed during each iteration of Manduca's method does not constitute a block of image values derived from an image, as recited in claim 1.

Dhawan discloses an adaptive neighborhood mask that modifies pixels with weighting factors to derive a contrast vector for the pixels within an adaptive neighborhood of a central pixel. The contrast vector is compared to a smoothing window and a pair of edge enhancement windows to determine whether the central pixel requires smoothing or enhancement to more clearly define a surface or an edge, respectively. If the element requires smoothing or enhancing, its gray scale value is modified, otherwise it is not modified. The resulting enhanced image is analyzed to determine if further enhancement is possible and, if so, the process continues upon

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the enhanced image data until the enhancement of the image data is maximized. In accordance with Dhawan's disclose, the determination of whether or not the enhancement has been maximized is made by evaluating the entropy of a normalized histogram of the contrast vectors (see col. 9, lines 35-50).

Dhawan only discloses that his entropy-based image enhancement evaluation metric, which produces a single value for the entire enhanced image, is used only to evaluate whether or not the image has been enhanced to a sufficient extent. Dhawan does not even hint that this metric could be used to produce "a respective result identifying the block as either an edge-containing block or a non-edge-containing block," as recited in claim 2. To the contrary, Dhawan expressly discloses that edges in the enhanced image are detected using an edge area selector that searches the contrast vectors for zero crossing points in the contrast vectors between adjacent pixels without any regard whatsoever to the entropy-based image enhancement evaluation metric (see col. 10, lines 44-63).

Thus, neither Manduca nor Dhawan discloses or suggests the producing element of claim 2. Therefore, there is no combination of Manduca and Dhawan that possibly could disclosure of suggest this element of claim 2.

For at least this reason, the rejection of independent claim 2 under 35 U.S.C. § 103(a) over Manduca in view of Dhawan now should be withdrawn.

2. Independent claim 12

Independent claim 12 has been amended and now recites elements that essentially track the pertinent elements of independent claim 2 discussed above. Therefore, independent claim 12 is patentable over Manduca in view of Dhawan for at least the same reasons explained above.

3. Independent claim 25

Independent claim 25 has been amended and now recites elements that essentially track the pertinent elements of independent claim 2 discussed above. Therefore, independent claim 25 is patentable over Manduca in view of Dhawan for at least the same reasons explained above.

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4.   Claims 28-30

Claims 28-30 have been canceled and will not be discussed.

B.   Claims 5, 8, 14-16, and 20-22

Claims 5, 8, 14-16, and 20-22 have been rejected under 35 U.S.C. § 103(a) over Manduca (U.S. 6,329,819) in view of Dhawan (U.S. 5,271,064) and Rafferty (U.S. 5,377,018).

1.   Claims 5 and 8

Each of claims 5 and 8 incorporates the elements of independent claim 2.

Rafferty does not make-up for the failure of Manduca in view of Dhawan to disclose or suggest the elements of independent claim 2 discussed above. Indeed, in accordance with Rafferty's disclosure, the metric used to determine the extent to which each block is compressed merely corresponds to the range of pixel values in the block (i.e., "the difference between a maximum luminance of any pixel in the block and the minimum luminance of any pixel in the block;" see abstract). This value does not constitute an entropy value computed from a histogram of image value differences in a block of image values, as recited in claim 2.

Therefore, claims 5 and 8 are patentable over Manduca in view of Dhawan and Rafferty for at least the same reasons explained above in connection with independent claim 2.

2.   Claims 14-16

Each of claims 14-16 incorporates the elements of independent claim 12.

Rafferty does not make-up for the failure of Manduca in view of Dhawan to disclose or suggest the elements of independent claim 12 discussed above (via independent claim 2).

Therefore, claims 14-16 are patentable over Manduca in view of Dhawan and Rafferty for at least the same reasons explained above in connection with independent claim 12.

3.   Claims 20-22

Each of claims 20-22 incorporates the elements of independent claim 25.

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Rafferty does not make-up for the failure of Manduca in view of Dhawan to disclose or suggest the elements of independent claim 25 discussed above (via independent claim 2).

Therefore, claims 20-22 are patentable over Manduca in view of Dhawan and Rafferty for at least the same reasons explained above in connection with independent claim 25.

C.   Claims 3, 13, and 26

Claims 3, 13, and 26 have been rejected under 35 U.S.C. § 103(a) over Manduca (U.S. 6,329,819) in view of Dhawan (U.S. 5,271,064) and Vaidyanathan (U.S. 5,481,620).

Claims 3, 13, and 26 respectively incorporate the elements of independent claims 2, 12, and 25.

Vaidyanathan does not make-up for the failure of Manduca in view of Dhawan to disclose or suggest the elements of independent claims 2, 12, and 25 discussed above. Indeed, Vaidyanathan merely discloses generating a gray level histogram of an image using a method that involves entropically selecting a threshold gray level that maximizes entropy of the histogram (see, e.g., col. 6, line 50 - col. 7, line 5).

Therefore, claims 3, 13, and 26 are patentable over Manduca in view of Dhawan and Vaidyanathan for at least the same reasons explained above in connection with independent claims 2, 12, and 25.

C.   Claims 4 and 27

Claims 4 and 27 have been rejected under 35 U.S.C. § 103(a) over Manduca (U.S. 6,329,819) in view of Dhawan (U.S. 5,271,064), Vaidyanathan (U.S. 5,481,620), and Liu (U.S. 5,594,807).

Claims 4 and 27 respectively incorporate the elements of independent claims 2 and 25.

Liu does not make-up for the failure of Manduca in view of Dhawan to disclose or suggest the elements of independent claims 2 and 25 discussed above. Indeed, the Examiner merely has cited Liu for his disclosure of a look-up table that contains normalized and integer-rounded histogram values (see, e.g., col. 10, lines 1-15).

Therefore, claims 4 and 27 are patentable over Manduca in view of Dhawan and Liu for at least the same reasons explained above in connection with independent claims 2 and 25.

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III.   Conclusion

For the reasons explained above, all of the pending claims are now in condition for

allowance and should be allowed.

Charge any excess fees or apply any credits to Deposit Account No. 08-2025.

Respectfully submitted,

Date: February 8, 2008

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